一、申論題 (10 pts) Scatter diagram is one of the commonly used quality tools for problem solving and process improvement. Please briefly describe the scatter diagram technique.

二、申論題 (10 pts) MRP outputs include primary reports and secondary reports. Please briefly describe these two types of reports.

三、申論題 (10 pts) Describe situations in which the single period model (or so-called the newsvendor model) is appropriate for replenishment problem-solving.

（計算題應詳列計算過程，無計算過程者不予計分）

四、計算題 (20 pts) XYZ Electric uses 4,000 switches a year. Switches are prices as follows: 1 to 499, 90 cents each; 500 to 999, 85 cents each; and 1,000 or more, 80 cents each. It costs approximately $30 to prepare an order and receive it, and carrying costs are 40 percent of purchase price per unit on an annual basis. Determine the optimal order quantity and the total annual cost.

五、選擇題 (18 pts) 每小題 3 分。請注意！回答時請標明題號，並以大寫 A、B、C、D、E 回答。 未標明題號者，以零分計算。

1. The process of comparing outputs to previously established standards to determine if corrective action is needed is called:
   A) planning
   B) directing
   C) controlling
   D) budgeting
   E) disciplining

2. Years ago in the overnight delivery business, providing package tracking capability gave some firms a competitive advantage. Now, all firms *must* offer this capability simply to be in this line of business. This is an example of _____ becoming _____ over time.
   A) Tactical implications; strategic
   B) Strategic implications; tactical
   C) Order winners; order qualifiers
   D) Profitability factors; productivity factors
   E) Order qualifiers; order winners

注意:背面有試題

3. The Balanced Scorecard is a useful tool for helping managers translate their strategy into action in the following areas:
   A) Customers; Financial; Internal Business Processes; Learning and Growth
   B) Sustainability; Flexibility; Efficiency; Technology
   C) Customization; Standardization; Efficiency; Effectiveness
   D) The Environment; The Community; Suppliers; Other Stakeholders
   E) Strategy; Tactics; Productivity; Profitability

4. In trend-adjusted exponential smoothing, the trend adjusted forecast (TAF) consists of:
   A) an exponentially smoothed forecast and a smoothed trend factor
   B) an exponentially smoothed forecast and an estimated trend value
   C) the old forecast adjusted by a trend factor
   D) the old forecast and a smoothed trend factor
   E) a moving average and a trend factor

5. The structural approach for integrating customer requirements into every aspect of product development is known as:
   A) total quality management
   B) customer satisfaction
   C) quality function deployment
   D) customer integration
   E) a product development team

6. An approach to location analysis that can include both qualitative and quantitative considerations is:
   A) location cost-volume
   B) transportation model
   C) factor rating
   D) expected value (net present value)
   E) financial analysis

六、 (6 pts) A new car dealer has been using exponential smoothing with an alpha of .2 to forecast weekly new car sales. Given the data below, would a naive forecast have provided greater accuracy? Please explain. Assume an initial exponential forecast of 60 units in period 2 (i.e., no forecast for period 1). 【請將計算過程寫出來，否則不計分】

注意:背面有試題

Period	Demand
1	57
2	62
3	58
4	60
5	60
6	56

七、(6 pts) A small business owner is contemplating the addition of another product line. Capacity increases and equipment will result in an increase in annual fixed costs of $50,000. Variable costs will be $25 per unit.

(a) (3 pts) What unit selling price must the owner obtain to break-even on a volume of 2,500 units a year? 【請將計算過程寫出來，否則不計分】

(b) (3 pts) Because of market conditions, the owner feels a revenue of $47 is preferred to the value determined in part A. What volume of output will be required to achieve a profit of $16,000 using this revenue? 【請將計算過程寫出來，否則不計分】

八、(20 pts) The construction manager for Acme Construction, Inc. must decide whether to build single-family homes, apartments, or condominiums. He estimates annual profits (in $000) will vary with the population trend as follows:

Type	Population Trend		
	Declining	Stable	Growing
Single Family	200	90	70
Apartments	70	170	90
Condos	-20	100	220

(a) (4 pts) If he uses the maximin criterion, which kind of dwellings will he decide to build? 【請將計算過程寫出來，否則不計分】

(b) (4 pts) If he uses the Laplace criterion, which kind of dwellings will he decide to build? 【請將計算過程寫出來，否則不計分】

(c) (4 pts) If he uses the minimax regret criterion, which kind of dwellings will he decide to build? 【請將計算過程寫出來，否則不計分】

注意:背面有試題

＊本科考試禁用計算器

(d) (4 pts) If he feels the chances of declining, stable, and growing population trends are 40%, 50%, and 10%, respectively, which kind of houses will he decide to build?【請將計算過程寫出來，否則不計分】

(e) (4 pts) If he feels the chances of declining, stable, and growing population trends are 40%, 50%, and 10%, respectively, what is his expected value of perfect information?【請將計算過程寫出來，否則不計分】

注意:背面有試題